AMENDMENT TO THE SPECIFICATION

Delete paragraph 0006, and add, as follows:

[0006] In case the ions are introduced into the ion trap mass spectrometer 13, an amount of introduced ions is greatly effected by the RF voltage applied to the ring electrode 14 of the ion trap mass spectrometer 13. For example, in case the phase of the RF voltage is a positive potential, positive ions which reach the ion trap mass spectrometer 13 are bounced back therefrom, so that the positive ions can not enter into the ion trap space. Also, in case the phase is a negative potential, the positive ions are excessively accelerated, and collide with the end cap electrode 16 in the exit side to disappear. In the limited intermediate phase between the positive potential and the negative potential, only a part of the ions which ~~reach~~ reaches the entrance of the ion trap mass spectrometer 13 can be introduced into the ion trap space. A range of the phase in which the ions are properly introduced into the ion trap space as described above is several percent of the total phases, and a large number of ions ~~are~~ is not provided to the analysis and discarded.

Delete paragraph 0011, and add, as follows:

[0011] The ion trap mass spectrometer may include a control section for controlling the entrance gate electrode, the exit gate electrode, the ion trap, and the ion storing section. According to the control by the control section, the entrance gate electrode is opened while the exit gate electrode is closed to introduce the ions into the ion storing section. After a first predetermined period of time, the entrance gate electrode is closed to accumulate the ions near the exit side of the ion storing section. After a second predetermined period of time, the exit gate electrode is opened to thereby emit a bunch of ions. A bunch of ions ~~are~~ is introduced into the ion trap with the ring electrode voltage being cut off. When the maximum amount of ions ~~stay~~ stays inside ~~of~~ the ion trap, the ring electrode voltage is suddenly applied. Thus, the ions can be trapped efficiently.

The listing of the claims will replace the previous version, and the listing of the claims:

LISTING OF THE CLAIMS

1.(currently amended) An ion trap mass spectrometer, comprising:

an ion supply source for supplying ions,

an ion storing section disposed ~~between~~ near the ion supply source ~~and an ion trap~~ and having an entrance side close to the ion supply source, an exit side opposite to the entrance side, and means for providing an RF electric field ~~with~~ for holding the ions inside ion storing section and an axial electric potential inclined from ~~an~~ the entrance side to ~~an~~ the exit side of the ion storing section ~~for confining~~ so that the ions are confined and gathered near the exit side ~~of~~ in the ion storing section,

an entrance gate electrode disposed between the ion supply source and the entrance side of the ion storing section, said entrance gate electrode being controlled to introduce and retain the ions in the ion storing section,

an exit gate electrode disposed ~~between~~ near the exit side of the ion storing section ~~and the ion trap~~, said exit gate electrode being controlled to retain the ions in the storing section and emitting a bunch of ions ~~to the ion trap~~, and

an ion trap section disposed at a side opposite to the ion storing section relative to the exit gate electrode and comprising means for cutting off an RF voltage while the bunch of ions emitted from the ion storing section enters ~~inside~~ the ion trap section, and means for suddenly applying the RF voltage when a maximum amount of the ions ~~stay~~ stays inside the ion trap section.

2.(currently amended) An ion trap mass spectrometer according to claim 1, wherein said ion storing section is formed of multipole electrodes as the means for providing the radio-frequency electric field, at least one part of the multipole electrodes being formed of a resistor for providing the axial electric potential.

3.(currently amended) An ion trap mass spectrometer according to claim 1, wherein said ion storing section is formed of multipole electrodes

as the means for providing the radio-frequency electric field, each electrode having plural sections divided in a longitudinal direction such that DC voltages are independently applied to the divided plural sections for providing the axial electric potential.

4.(currently amended) An ion trap mass spectrometer according to claim 1, wherein said ion storing section is formed of an assembly electrode as the means for providing the radio-frequency electric field, said assembly electrode including a plurality of annular electrodes arranged in an axial direction such that DC voltages and RF voltages are independently applied to the respective annular electrodes for providing the axial electric potential.

5.(currently amended) An ion trap mass spectrometer according to claim 1, further comprising an ion lens disposed between the exit gate electrode and the ion trap section.

6.(currently amended) An ion trap mass spectrometer according to claim 1, further comprising control means connected to the entrance gate electrode, the exit gate electrode, the ion trap section, and the ion storing section for controlling the same, said control section controlling the entrance gate electrode and the exit gate electrode so that the entrance gate electrode is opened and the exit gate electrode is closed to introduce the ions into the ion storing section; after a first predetermined period of time, the entrance gate electrode is closed while the exit gate electrode is closed to accumulate the ions at the exit side of the ion storing section; after a second predetermined period of time, the exit gate electrode is opened to introduce the accumulated ions into the ion trap section at once.

7.(original) An ion trap mass spectrometer according to claim 6, wherein said control means determines the first predetermined period of time as a time for opening the entrance gate electrode based on a total ion amount measured in one of preceding same steps.

A3 cont'd

8.(currently amended) An ion trap mass spectrometer according to claim 6, wherein said control means controls said means for providing ~~radio-frequency~~ the RF electric field to change at least one of parameters of the ~~radio-frequency~~ RF electric field and inclined electric potential so that ions other than desired ions are excluded from the ion storing section before the ions are introduced into the ion trap section.

9.(original) An ion trap mass spectrometer according to claim 6, wherein said control means controls the means for providing the RF electric field to stop an application of the RF voltage to the ion storing section before introducing the ions therein so that the ions remaining in the ion storing section are removed.

10.(original) An ion trap mass spectrometer according to claim 1, wherein a cooling gas is introduced into the ion storing section together with the ions.